

**Commonwealth of Kentucky**  
**Division for Air Quality**  
***PERMIT STATEMENT OF BASIS***

TITLE V (DRAFT PERMIT) NO. V-04-048  
RIVERSIDE GENERATING COMPANY, L.L.C.  
CATLETTSBURG, KY  
SEPTEMBER 22, 2004  
RALPH E. GOSNEY, REVIEWER  
PLANT I.D. # 21-127-00040  
AGENCY INTEREST # 4392

**SOURCE DESCRIPTION:**

An application for a renewal to the Title V Permit, V-99-051 Revision III, for the Riverside Generating Company, L.L.C. was received on August 4, 2004. A Title IV Acid Rain Permit application was received on June 25, 2004 and a nitrogen oxides (NO<sub>x</sub>) Budget Permit application was received on November 25, 2002.

The facility is classified as a Title V major source of air pollution based on the potential to emit more than 100 tons per year (tpy) of particulate matter less than 10 micrometers (PM<sub>10</sub>), carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), and volatile organic compounds (VOC). In addition, the facility has the potential to emit more than 10 tpy of formaldehyde (HCOH).

The source produces electricity from the combustion of natural gas. The source is operated primarily in summer months when loads are at the highest levels. There are 5 natural gas turbines for the generation of electricity, Emission Units 01 – 05. There are two natural gas-fired indirect heaters, Emission Units 06 and 07 for heating fuel fed to the turbines. There are no significant modifications to the facility for the Title V renewal. The facility will keep the source-wide emissions caps, in order to preclude 401 KAR 51:017, of 245 tpy for CO and NO<sub>x</sub>, during any consecutive 12-month period.

The following is a list of significant emission units.

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|------------|--|
| E. Unit 01 | Natural Gas-Fired Turbine for Electric Generation, 2076 mmBtu/hr       |
| E. Unit 02 | Natural Gas-Fired Turbine for Electric Generation, 2076 mmBtu/hr       |
| E. Unit 03 | Natural Gas-Fired Turbine for Electric Generation, 2076 mmBtu/hr       |
| E. Unit 04 | Natural Gas-Fired Turbine for Electric Generation, 2076 mmBtu/hr       |
| E. Unit 05 | Natural Gas-Fired Turbine for Electric Generation, 2076 mmBtu/hr       |
| E. Unit 06 | Natural Gas-Fired Indirect Heater w/Forced Draft Burner, 14.6 mmBtu/hr |
| E. Unit 07 | Natural Gas-Fired Indirect Heater w/Forced Draft Burner, 10.7 mmBtu/hr |

**COMMENTS:**

E. Unit 01	Natural Gas-Fired Turbine for Electric Generation, 2076 mmBtu/hr
E. Unit 02	Natural Gas-Fired Turbine for Electric Generation, 2076 mmBtu/hr
E. Unit 03	Natural Gas-Fired Turbine for Electric Generation, 2076 mmBtu/hr
E. Unit 04	Natural Gas-Fired Turbine for Electric Generation, 2076 mmBtu/hr
E. Unit 05	Natural Gas-Fired Turbine for Electric Generation, 2076 mmBtu/hr

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The five units are Siemens-Westinghouse 501FD natural gas-fired turbines. Emission Units 01, 02, and 03 were installed in May of 2001. Emission Units 04 and 05 were installed in May of 2002. Each unit has a maximum generation capacity of 208 MW and a nominal capacity of 176 MW. Each combustion turbine has a maximum fuel input capacity of 2,076 million British thermal units per hour (mmBtu/hr). Each turbine is equipped with dry low-nitrogen oxide burners and water injection to lower the combustion temperature for NO<sub>x</sub> emission control. Emission Units 04 and 05 have selective catalytic reduction (SCR) systems for reduction of NO<sub>x</sub>, in addition to the dry low-nitrogen oxide burners and water injection.

The following regulations are applicable to the units:

401 KAR 60:005, Section 3(nn)	Incorporating by reference 40 CFR 60, Subpart GG;
40 CFR 60, Subpart GG	Standards of Performance for Stationary Gas Turbines, for emission units with a heat input equal to or greater than 10 mmBtu/hr for which construction commenced after October 3, 1977;
401 KAR 52:060	Acid Rain Permits; and
40 CFR Part 75	Continuous Emission Monitoring (CEM)

No units have applicable NO<sub>x</sub> limits set by 40 CFR Part 76.

In order to preclude 401 KAR 51:017, the maximum concentration of CO shall not exceed 50 ppm and the maximum concentration of NO<sub>x</sub> shall not exceed 20 ppmdv @ 15% O<sub>2</sub>, in any three-hour average, except during the start-up and shut-down period. Pursuant to 40 CFR 60.332(a)(1), emission of NO<sub>x</sub> shall not exceed 0.01107 % by volume at 15% oxygen on a dry basis (limit met by meeting the 20 ppmdv at 15% O<sub>2</sub> limit to preclude 401 KAR 51:017). For compliance with the CO and NO<sub>x</sub> emission limits, the permittee will monitor emission from CEMs that meet the requirements of 40 CFR 60, Subpart GG, and 40 CFR, Part 75.

Pursuant to 40 CFR 60.333, the maximum concentration of SO<sub>2</sub> shall not exceed 0.015 % by volume at 15 percent oxygen on a dry basis OR the source shall not burn any fuel which contains sulfur in excess of 0.8 percent by weight (8000 ppmw). To preclude 401 KAR 51:017, the fuel sulfur content due to the firing of pipeline quality natural gas shall not exceed 1.0 grains/100 dscf of natural gas. For compliance with the SO<sub>2</sub> emission limits, the permittee shall monitor the total sulfur content of the fuel being fired in the turbines.

Due to the lower sulfur content limit of 1.0 grains/100 dscf of natural gas (lower than the 40 CFR 60,

Subpart GG limit), the monitoring requirements shall meet the minimum requirements of 40 CFR 60, Subpart GG. The frequency for monitoring for sulfur content of the fuel shall be once per month, if the unit is in operation during that month. The units are operated during the peaking season.

In order to preclude 401 KAR 51:017, the emission units shall have a maximum total annual (12-month rolling average) operating time of 4580 hours per combustion turbine. Natural gas shall be the sole fuel fired in the turbines. For compliance with the hourly rate limit on the combustion turbines and the type of fuel fired in the turbine, the permittee shall monitor and record the hours of operation and the usage rate and type of fuel from each combustion turbine.

The permittee has completed all initial performance tests required by 40 CFR 60, Standards of performance for new stationary sources (NSPS). The turbines have not been operated to maximum capacity. No additional stack testing will be required during the life of this permit unless there are deviations from the permit requirements (then stack tests may be required to show compliance), due to the low utilization of the units. The permittee shall monitor, record, and report all applicable requirements for each unit, pursuant to 40 CFR 60, Subpart GG.

E. Unit 06      Natural Gas-Fired Indirect Heater w/Forced Draft Burner, 14.6 mmBtu/hr  
E. Unit 07      Natural Gas-Fired Indirect Heater w/Forced Draft Burner, 10.7 mmBtu/hr

Emission Unit 06 is a GasTech indirect heater with forced draft burner, and a maximum fuel input of 14.6 mmBtu/hr. Emission Unit 07 is a TranAm indirect heater with forced draft burner, and a maximum fuel input of 10.71 mmBtu/hr. The units burn natural gas as a fuel. The units are used to heat natural gas from the transmission pipeline, prior to feeding the gas to the combustion turbines.

The following regulations are applicable to the unit:

401 KAR 59:015	New Indirect Heat Exchangers applies to new affected facilities less than 250 mmBtu/hr commenced on or after April 9, 1972;
401 KAR 60:005 Section 3(e)	Incorporating by reference 40 CFR 60 Subpart Dc; and
40 CFR 60 Subpart Dc	Standards of performance for small industrial-commercial-institutional steam generating units applies to each affected facility that commenced construction after June 9, 1989.

In order to preclude 401 KAR 51:017, the combined annual emissions of NO<sub>x</sub> from the heaters shall not exceed 1.42 tons/yr. In order to preclude 401 KAR 51:017, the combined annual emissions of CO from the heaters shall not exceed 0.59 tons/yr. The monthly emission of NO<sub>x</sub> from the natural gas-fired heaters shall be based on the monthly amount (million standard cubic feet) of natural gas burned by each heater and an emission factor of 122.97 pounds per million standard cubic feet of natural gas burned. The monthly emission of CO from the natural gas-fired heaters shall be based on the monthly amount (million standard cubic feet) of natural gas burned by each heater and an emission factor of 51.48 pounds per million standard cubic feet of natural gas burned.

Pursuant to 401 KAR 59:015 Section 4(1), each unit shall limit emissions of PT (particulate matter) not to exceed 0.15 lb/mmBtu actual heat input. Pursuant to 401 KAR 59:015 Section 5(1), each unit shall limit emissions of SO<sub>2</sub> not to exceed 0.33 lb/mmBtu actual heat input. Compliance with the PT and SO<sub>2</sub> emission limits for these units are demonstrated while burning natural gas.

Pursuant to 401 KAR 59:015 Section 4(2), each unit shall have a visible emissions maximum limitation of 20 % opacity, except a maximum of 40% opacity shall be permissible for not more than 6 consecutive minutes in any 60 consecutive minutes during cleaning of the firebox, blowing of soot and building of a new fire. Compliance with the opacity emission limits for these units are demonstrated while burning natural gas.

The permittee shall monitor and record the monthly fuel usage, the average monthly fuel heat content, and the monthly hours of operation.

**OPERATIONAL FLEXIBILITY: N/A**

**EMISSION AND OPERATING CAPS DESCRIPTION:**

In order to preclude 401 KAR 51:017, the facility has existing source-wide emission limits of 245 tpy for CO and NO<sub>x</sub>, during any consecutive 12-month period.

The permittee shall assure compliance with the CO emission limitation by summing the monthly emission of CO from all emission units at the facility. The monthly emission of CO from the turbines shall be determined from continuous emission monitors (CEMs) for the combustion turbines. The monthly emission of CO from the natural gas-fired heaters shall be based on the monthly amount (million standard cubic feet) of natural gas burned by each heater and an emission factor of 51.48 pounds per million standard cubic feet of natural gas burned. Emissions from insignificant activities shall be based on AP-42 or engineering judgement approved by the Division. The maximum operating time for the insignificant activities (emergency electric generators and emergency water pump) shall not exceed 250 hours in any consecutive twelve months total. Records of CO emissions emitted from the source in any consecutive twelve (12) month period shall be reported quarterly to the Kentucky Division for Air Quality's Ashland Regional Office.

The permittee shall assure compliance with the NO<sub>x</sub> emission limitation by summing the monthly emission of NO<sub>x</sub> from all emission units at the facility. The monthly emission of NO<sub>x</sub> from the turbines shall be determined from continuous emission monitors (CEMs) for the combustion turbines. The monthly emission of NO<sub>x</sub> from the natural gas-fired heaters shall be based on the monthly amount (million standard cubic feet) of natural gas burned by each heater and an emission factor of 122.97 pounds per million standard cubic feet of natural gas burned. Emissions from insignificant activities shall be based on AP-42 or engineering judgement approved by the Division. The maximum operating time for the insignificant activities (emergency electric generators and emergency water pump) shall not exceed 250 hours in any consecutive twelve months total. Records of NO<sub>x</sub> emissions emitted from the source in any consecutive twelve (12) month period shall be reported quarterly to the Kentucky Division for Air Quality's Ashland Regional Office.

# **REGULATIONS NOT APPLICABLE:**

40 CFR Part 63 Subpart YYYY – National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines, does not apply to the source. The combustion turbines are existing units, as defined by 40 CFR Part 63 Subpart YYYY and do not have to meet the requirements of 40 CFR Part 63 and subpart A of 40 CFR Part 63.

# **CREDIBLE EVIDENCE:**

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has not incorporated these provisions in its air quality regulations.

# **PAST PERMIT SUMMARY:**

Permit type	Log #	Complete Date	Issuance Date	Summary of Action
V-99-051 Title V/Synthetic Minor w/Acid Rain	G253	9/29/1999	2/24/2000	Initial Title V/Synthetic Minor w/Acid Rain
V-99-051 (Revision I) Title V/Synthetic Minor w/Acid Rain	53201	10/11/2000	2/2/2001	Major Revision – Installation two additional natural-gas turbines for electric generation w/Acid Rain Revision
V-99-051 (Revision II) Title V/Synthetic Minor w/Acid Rain	53722	5/26/2001	6/6/2001	Minor Revision – Installation of SCR on 2 turbines and custom fuel monitoring
V-99-051 (Revision III) Title V/Synthetic Minor w/Acid Rain	54149	2/26/2002	3/8/2002	Minor Revision – Installation of emergence diesel generator w/245 tpy limit for CO and NOx (from 249)
V-04-048 Draft Title V w/Acid Rain and NOx Budget	AI# 4392	9/15/04	10/22/04	Title V renewal – minor revision for additional insignificant activities